

WHAT IS CLAIMED IS:

1. A method for estimating labor costs associated with producing a printed circuit board assembly comprising the steps of:

projecting volume for a predetermined period of time for the printed circuit board assembly;

calculating a cost of conversion at a predetermined percentage of surface mount technology components of the printed circuit board assembly; and

generating a cost of conversion for the printed circuit board assembly based on actual percentage of surface mount technology components of the printed circuit board assembly from the cost of conversion at the predetermined percentage.

2. A method as described in Claim 1 wherein the predetermined percentage is 90% and the calculating step includes the step of inputting the projected annual volume for the printed circuit board assembly into

$$\text{Cost of Conversion} = 1.4392 * \text{volume}^{-0.3920}.$$

3. A method as described in Claim 2 wherein the generating step includes the step of inserting the actual percentage of surface mount technology components of the printed circuit board assembly and the cost of conversion at the predetermined percentage into

$$\$CPPx = \$CPP90 - \left[\$CPP90 \left[\frac{SMT\%}{90} - 1 \right] \right]$$

Where:

- \$CPP90 is the cost of conversion at 90% SMT components derived from Equation 1 and
- SMT% is the actual percentage of SMT components for a particular PCBA, entered as a regular number (87 for 87%, not 0.87)
- \$CPPx is the cost of conversion at X% SMT components

4. A method for building a printed circuit board assembly comprising the steps of:

estimating labor costs associated with producing the printed circuit board assembly with a computer as a function of volume of the printed circuit board assembly produced per unit time and percentage of surface mount technology components of the printed circuit board; and

producing the printed circuit board assembly.

5. An apparatus for estimating labor costs associated with producing a printed circuit board assembly comprising:

a computer having means for estimating costs associated with a labor portion of manufacturing the printed circuit board assembly; and

an input device for inputting information for estimating the costs into the computer.

6. An apparatus as described in Claim 5 wherein the estimating means includes:

means for calculating a cost of conversion at a predetermined percentage of surface mount technology components of the printed circuit board assembly; and

means for generating a cost of conversion for the printed circuit board assembly based on actual percentage of surface mount technology components of the printed circuit board assembly from the cost of conversion at the predetermined percentage.

7. An apparatus as described in Claim 6 wherein the predetermined percentage is 90% and the calculating means calculates the cost of conversion at the predetermined percentage based on

$$\text{Cost of Conversion} = 1.4392 * \text{volume}^{-0.3920}$$

where volume is a projected annual volume for the printed circuit board assembly.

8. An apparatus as described in Claim 7 wherein the generating means generates the cost of conversion for the printed circuit board assembly based on

$$\$CPPx = \$CPP90 - \left[\$CPP90 \left[\frac{SMT\%}{90} - 1 \right] \right]$$

Where:

- $\$CPP90$ is the cost of conversion at 90% SMT components derived from Equation 1 and
- $SMT\%$ is the actual percentage of SMT components for a particular PCBA, entered as a regular number (87 for 87%, not 0.87)
- $\$CPPx$ is the cost of conversion at X% SMT components

9. A computer program product for enabling a processor in a computer to estimate costs associated with producing a printed circuit board assembly comprising:

a computer readable program code means for enabling the computer to estimate costs with a labor portion of manufacturing the printed circuit board assembly.

10. A computer program product as described in Claim 9 wherein the code means includes means for calculating a cost of conversion at a predetermined percentage of surface mount technology components of the printed circuit board assembly; and

means for generating a cost of conversion for the printed circuit board assembly based on actual percentage of surface mount technology components of the printed circuit board assembly from the cost of conversion at the predetermined percentage.

11. A computer program product as described in Claim 10 wherein the predetermined percentage is 90% and the calculating means calculates the cost of conversion at the predetermined percentage based on

$$\text{Cost of Conversion} = 1.4392 * \text{volume}^{-0.3920}$$

where volume is a projected annual volume for the printed circuit board assembly.

12. A computer program product as described in Claim 11 wherein the generating means generates the cost of conversion for the printed circuit board assembly based on

$$\$CPP_x = \$CPP90 - \left[\$CPP90 \left[\frac{SMT\%}{90} - 1 \right] \right]$$

Where:

- $\$CPP90$ is the cost of conversion at 90% SMT components derived from Equation 1 and
- $SMT\%$ is the actual percentage of SMT components for a particular PCBA, entered as a regular number (87 for 87%, not 0.87)
- $\$CPP_x$ is the cost of conversion at X% SMT components